

REMARKS

In the Office Action, the Examiner objected to the drawings, objected to the specification, and rejected the claims under 35 USC §112 and under 35 USC §103. These objections and rejections are fully traversed below.

The claims have been amended to correct minor informalities and to further clarify the subject matter regarded as the invention. In addition, a few minor amendments have been made to the specification to improve its form.

The Examiner has indicated that claims 8, 9, 19 and 28 are objected to, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Thus, the claims have been amended accordingly to expedite allowance of the pending claims. Applicant reserves the right to pursue claims of the same or similar scope in a subsequent continuation application. Specifically, claims 3-7 and 10 have been amended to depend from allowable claim 8, claims 20-22 have been amended to depend from allowable claim 19, and claims 24, 27 have been amended to depend from allowable claim 28. Thus, each of claims 3-15 depends from allowable claim 8, and are therefore allowable. In addition, computer-readable medium claims 59-61 have been amended corresponding to allowable claim 8, and apparatus claims 67-68 have been added corresponding to allowable claim 8. Moreover, computer-readable medium claim 62 has been amended corresponding to allowable claim 19, and apparatus claims 69-70 have been added corresponding to allowable claim 19. In addition, computer-readable claim 65 has been amended corresponding to allowable claim 28, and apparatus claims 71-72 have been added corresponding to allowable claim 28. Claims 1-2, 16-18, 23, 25-26, 30, 39, 63-64, and

66 have been cancelled. Accordingly, Applicant respectfully submits that claims 3-15, 19-22, 24, 27-28, 59-61, 62, 65, and 67-72 are allowable in view of the Examiner's indication of allowable subject matter.

In addition, Applicant respectfully submits that the remaining claims 29, 31-38, and 40-58 are patentable, in view of the remarks set forth below.

Claims 3-15, 19-22, 24, 27-28, 29, 31-38, 40-58, 59-62, 65, 67-72 remain pending. Reconsideration of the application is respectfully requested based on the following remarks.

OBJECTION TO THE DRAWINGS

In the Office Action, the Examiner objected to the drawings. Applicant submits herewith FIG. 8, as amended in red ink, which indicates that the Network Layer corresponds to numeral “833.” The corresponding pages of the specification have also been amended accordingly. Therefore, it is respectfully requested that the Examiner withdraw the objection to the drawings.

OBJECTION TO THE SPECIFICATION

In the Office Action, the Examiner objected to the specification due to various typographical errors. The specification has been amended accordingly. However, the Examiner has indicated that there is no description of Figure 1 in the specification. Applicant respectfully submits that the description of Figure 1 is set forth on pages 2-3 of the specification. In addition, Applicant respectfully submits that element 202 is disclosed on page 8 of Applicant’s specification as line card A. In addition, Examiner indicates that “in Figure 7B, 252 does not appear. However, there is no mention of element 252 in the specification with respect to FIG. 7B. Clarification is therefore requested. Moreover, FIG. 2 and 2B have been amended to remove element 251, 215a, 215b, 215c, 215d, 217, and 227. Similarly, FIG. 3 and 3B have been amended to remove element 351, 315a, 315b, 315c, 315d, 317, and 327. FIG. 7A has also been amended to remove element 765 and 775. Hence, it is respectfully requested that the Examiner withdraw the objection to the specification.

REJECTION OF CLAIMS UNDER 35 USC §112

In the Office Action, the Examiner rejected the claims under 35 USC §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Applicant respectfully traverses the assertion that the specification fails to provide support for the phrase “the access network is a wireless network.” In fact, an exemplary wireless network in which the invention may be implemented is illustrated in FIG. 9 and described in the associated text. Hence, Applicant respectfully requests that the Examiner withdraw the rejection of the claims under 35 USC §112, second paragraph.

REJECTION OF CLAIMS UNDER 35 USC §103

As described above, the claims have been amended in accordance with the Examiner’s indication of allowable subject matter. Therefore, Applicant respectfully submits that claims 3-15, 19-22, 24, 27-28, 59-61, 62, 65, and 67-72 are allowable.

In addition, Applicant respectfully submits that the remaining claims 29, 31-38, and 40-58 are patentable, in view of the remarks set forth below.

As set forth in Applicant’s specification, it is common practice to statically configure each line card to include a single downstream channel transmitter and a pre-determined number of upstream channel receivers (up to a maximum of 6 upstream receivers). Due to the static configuration of conventional cable networks such as that shown in FIGURE 2, it is common practice to assign the downstream and upstream channels of each physical line card

within the CMTS to a unique DOCSIS domain. By assigning each line card (and its associated downstream and upstream channels) to a unique DOCSIS domain, one is able to take full advantage of the limited addressing space available within each DOCSIS domain.

Because conventional line cards are configured to include at most six upstream receivers, it is not possible for a cable operator (or other service provider) to configure a cable network to have a DOCSIS domain which includes, for example, one downstream channel and eight upstream channels. Even if two extra upstream channels were available on a separate line card, it would not be possible to include these two extra channels in the DOCSIS domain associated with the first line card.

In conventional cable networks, it is not possible for a cable modem to "listen" to the CMTS on a downstream channel associated with a first line card, and "talk" to the CMTS on an upstream channel associated with a different line card. Thus, as shown in FIGURE 2B, the cable modems of domain A (e.g. Group A 260a) are not able to "listen" to the CMTS on downstream channel A (213) and "talk" to the CMTS using upstream channels 219b (associated with receivers B1 and B2). This is because line card A uses a different time reference than that of line card B. More specifically, the time reference for downstream channel A is generated by a local timestamp counter within MAC controller 206, and the time reference for downstream channel B is generated by a different timestamp counter within MAC controller 208. Moreover, the timestamp counters of MAC controllers 206 and 208 are not synchronized, meaning that the time reference for line card A is different than the time reference for line card B.

However, in accordance with various embodiments of the present invention, it is possible to configure a single domain which includes a plurality of upstream channels in which a first portion of the upstream channels is associated with ports residing on a first line

card, and a second portion of upstream channels is associated with ports residing on a second line card.

The technique of various embodiments of the present invention involves utilizing a master time reference device which maintains and updates a current time reference, and periodically distributes synchronization signals to desired line cards in the system in order to synchronize these line cards. In a specific embodiment, the synchronization signals include current timestamp data generated from the master time reference device and distributed to all (or selected) line cards in the system. A slave time reference device on each of the line cards receives the periodic synchronization updates and uses the synchronization data to remain synchronized with the master time reference device. There are also provisions in this protocol to allow for hot insertion and removal of line cards, software reset or loading of the master and/or slave time reference devices, and redundant master time reference devices, including master time reference device fault detection and automatic fail over.

In the Office Action, the Examiner rejected the claims 29, 32-38, 42-54 and 56-58 under 35 USC §103 as being unpatentable over Applicant's admitted prior art in view of U.S. Patent No. 6,379,159 to Eidson. This rejection is fully traversed below.

The Examiner admits that a method for synchronizing these time reference devices in the access network is not disclosed, where at least one synchronization signal is provided to the first and second access controllers and utilizing the signal at the first and second controllers in a manner which results in both time reference devices being in synchronization with each other. Moreover, such synchronization in a system in a cable network, where the nodes are cable modems, and where the Head End is a CMTS is neither disclosed nor suggested by the cited art. In fact, as described above, different timestamp counters have traditionally been used. As such, Applicant respectfully submits that the admitted prior art

teaches away from implementing synchronization in an access network as claimed.

Therefore, Applicant respectfully submits that there fails to be a motivation to combine the cited references in this manner. Accordingly, Applicant respectfully submits that the rejected claims are patentable over the cited art.

With respect to the additional claims (e.g., claims 33), the admitted prior art teaches away from implementing a system in which synchronization is used to overcome the problems present in the prior art in a cable network, as described above. For instance, such synchronization is claimed in claim 45, where the first and second plurality of ports may belong to the same (claim 46) or a different (claim 47) domain.

U.S. Patent No. 5,751,220, to Ghaffari fails to cure the deficiencies of the primary reference with reference to claims 31 and 40-41. Specifically, the Examiner claims that Ghaffari discloses a back-up time reference device for maintaining and updating the current time reference, and for providing the current time reference to each of the slave time reference devices at times when a failure is detected at the master device. However, Applicant respectfully submits that the admitted prior art teaches away from implementing synchronization in the system as claimed. Therefore, Applicant respectfully submits that there fails to be a motivation to combine the cited references in this manner. As such, Applicant respectfully submits that claims 31, 40-41, and 50 are patentable over the cited references.

The dependent claims depend from one of the independent claims and are therefore patentable for at least the same reasons. However, the dependent claims recite additional limitations that further distinguish them from the cited references. The additional limitations recited in the independent claims or the dependent claims are not further discussed as the above discussed limitations are clearly sufficient to distinguish the claimed invention from

the cited art. Thus, it is respectfully requested that the Examiner withdraw the rejection of the claims under 35 USC §103(a).

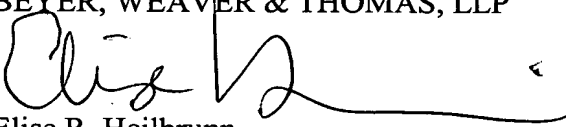
SUMMARY

Reconsideration of the application and an early Notice of Allowance are earnestly solicited.

If there are any issues remaining which the Examiner believes could be resolved through either a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned attorney at the telephone number listed below.

Applicants hereby petition for an extension of time which may be required to maintain the pendency of this case, and any required fee for such extension or any further fee required in connection with the filing of this Amendment is to be charged to Deposit Account No. 50-0388 (Order No. CISCP131).

Respectfully submitted,
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